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Magnetic resonance spectroscopy of perpendicularly magnetized Permalloy multilayer disks

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Abstract

Using a magnetic resonance force microscope, we compare the ferromagnetic resonance spectra of individual micron size disks with identical diameter, 1 μm, but different layer structures. For a disk composed of a single 43.3-nm -thick Permalloy (Py) layer, the lowest energy mode in the perpendicular configuration is the uniform precession. The higher energy modes are standing spin waves confined along the diameter of the disk. For a Cu (30 nm) Py (100 nm) Cu (30 nm) multilayer structure, it has been interpreted that the lowest energy mode becomes a precession localized at the Cu/Py interfaces. When the multilayer is changed to Py (100 nm) Cu (10 nm) Py (10 nm), this localized mode of the thick layer becomes coupled to the precession of the thin layer. © 2007 American Institute of Physics.

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